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ABSTRACT

This study examines the relationship between societal forces and school computer use in the context of two issues surrounding computer technology: computer property and computer privacy. Four types of data were collected from district administrators, principals, computer teachers, and students over a 9-month period in a high school with a broad, well-integrated computer education program. Methods employed were naturalistic observation, informal interviews, historical document analysis, and structured interviews. Observed conflicts surrounding classroom interactions pertaining to copying software were partly in response to the institutionalization at the district level of a policy that upheld the property rights of computer programs, but failed to provide compensatory funding for purchasing programs. This inadequate funding helps explain why teachers at times condoned and at times prohibited unauthorized copying of commercial software, and why so little explicit instruction addressed the issue of ethics with students. Observed conflicts surrounding the issue of computer privacy resulted from a conception on the part of the principal, teachers, and students that access to computer files was subordinate to and determined by learning--the central task at hand. This finding helps explain why students neither asserted nor protected the privacy of their files, and why the classroom projected a nonchalant attitude toward accessing electronic information despite the societal climate. (20 references) (GL)

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Societal Issues and School Practices: An Ethnographic Investigation of the Social Context of School Computer Use

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Societal Issues and School Practices:
An Ethnographic Investigation of the Social Context of School Computer Use

It is becoming increasingly apparent that societal as well as educational forces influence schooling (Ogbu, 1974, 1980). However, little research has specifically addressed this relation in the context of school computer use. For example, quantitative studies have reported on classroom management strategies and subject area use (Becker, 1986; Quality Education Data, 1986; Watkins & Brimm, 1985) while qualitative studies have largely treated school computer use as a self-contained unit comprised of only computers, curriculum, students, teachers, and administrators (Hawkins, Sheingold, Gearhart, & Berger, 1982; Mathinos & Woodward, 1988; Yin & White, 1985). This study takes up this relation between societal forces and school computer use in the context of two important and controversial issues about computer technology: computer property and computer privacy.

Computer property issues involve the unauthorized copying of commercial software. At stake societally is who has what rights to intellectual (electronic) property and what short-term and long-term economic harm is caused by such acts as pirating software (Johnson, 1985; Taylor, 1986). Computer privacy issues involve unauthorized access to computer files. Like computer property, at stake here is the issue of rights and welfare: in this case, who has what privacy rights to electronic information and what economic and psychological harm is involved by privacy violations (Bloombecker, 1985; Yee, 1985). This study examined how societal forces pertaining to the largely comparable issues of computer property and computer priva ffect actual school practices.

Data Source and Methods

To allow for the possibility that the societal issues surrounding computer property and privacy may have shaped and perhaps constrained school practices, this research was conducted in a high school with a broad, well-integrated computer education program. The high school was located in a middle income neighborhood in the San Francisco Bay Area. Each semester, approximately 30% of the students with varied academic abilities and interests used computers in computer science, business, and journalism courses, an extracurricular science program, and during "lunchtime" computer use. Students attending the high school were of mixed ethnic and social backgrounds as assessed by students' racial status and the level of education attained by their parents and reported in the 1986 Survey of Basic Skills.

As the research aimed to investigate the role of societal forces in shaping school practices, flexible qualitative methods were required that could capture both the subtleties of school activities and the district administrators', principal's, computer teachers' and computer students' perspectives on these activities (see Becker & Geer, 1957; Spradley, 1979, 1980; and Martin, 1988). Four types of data were collected over a nine month period including naturalistic observation, informal interviews, historical documents, and structured interviews. An outsider's view of school practices was obtained through naturalistic observation, including 29 observation sessions (each lasting 40-50 minutes) that focused on the handling and use of electronic information in all of the places in the school where students used computers. Insiders' (e.g., district administrators', principal's, teachers', students') views of school practices were obtained through informal interviews, historical documents, and structured interviews. Over the course

of the school year, a total of 37 informal interviews were conducted, 3 with district administrators, 4 with school administrators, 20 with teachers, and 10 with students. When participants mentioned district level policies or other historical documents in the course of an interview, the document was obtained and incorporated into the analysis of the participant's point of view. Finally, a structured interview on students' perceptions of school rules and practices pertaining to computer use was conducted with 42 students who had used computers at the school. Approximately half of these students (20) were interviewed on computer property practices while the other half (22) of the students were interviewed on computer privacy practices. Whenever possible, triangulation of data sources was used to increase internal reliability.

School Practices and Insiders' Perspectives

Copying Commercial Computer Programs

Observations: An outsider's view.

From observations of typical classroom practices, it appeared that teachers sometimes did not and other times did condone copying commercial software and the use of unauthorized copies. For instance, on rare occasions teachers provided explicit instruction against copying.[1] Teachers also confiscated illegal copies when they caught students discretely using classroom equipment to copy and trade commercial software among

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[1] During the course of this study only a small amount of explicit instruction against copying software was noted: one computer teacher addressed the issue briefly at the beginning of the semester with each of his classes and the Vice Principal once spoke to an advanced computer science class about the ethics and harmful effects of copying commercial software.

themselves. However, in the latter situation, teachers returned the confiscated diskettes to students within a few days. Moreover, teachers themselves distributed unauthorized copies of software, which often displayed a copyright, to students for classroom use.[1]

These observations raise several questions about the relation between school practices and the copying of commercial software. Why did teachers at times condone and at other times prohibit unauthorized copying of software? What was the relationship between teachers' practices and administrative policy? How did students interpret these conflicting classroom practices? An examination of administrators', teachers', and students' perspectives on computer piracy in the school context provides some answers to these questions.

Perspectives: Insiders' views.

The district's Policy on Software Copyright (May, 1985) states that: (1) ethical and practical problems caused by piracy will be taught; (2) efforts will be made to secure software from copying; and (3) illegal copies will not be made or used on school equipment. This policy most likely arose in response to two factors. One factor entails the force of district politics in which a few key persons in the district loudly voiced their concerns and pushed the policy through the official channels. The second factor entails a desire for legal protection should a school within the district be charged with illegal practices. However, despite the district's policy calling for legal software (and most

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[1] Teachers distributed illegal copies of commercial software as standard classroom materials in the following courses using computers: Computer Literacy, Computer Science Advanced, Computer Science Advanced Placement, Journalism 1 and 2, and Data Processing.

likely reflecting the district's generally tight budget), the district offered no additional funds or alternative sources for the software needed to replace illegal copies currently in classroom use. Thus the practical application of the district's policy was that individual schools would either have to find the extra funds or discontinue those educational programs that depended on the use of illegal software.[1]

The school principal believed her school had a responsibility on the one hand to teach students right from wrong, to uphold the law, and to follow district policy, and, on the other hand, to provide students with a quality education. While these responsibilities need not be mutually exclusive, in this situation funding limitations made them practically so: students' education would be compromised by upholding the law and district policy. The result was that in practice the principal did little to promote or hinder the district's policy; rather she primarily took a stance of supporting the positions advocated by her teachers. When teachers requested funds for new software she tried to obtain them. When teachers suggested the possibility of site licences she agreed to investigate them. She did not prohibit teachers from offering classes that depended on the use of illegal copies and when teachers objected to teaching computer ethics while illegal software was in use in their classrooms, she did not force them. Thus, the principal viewed herself in a holding position -- squeezed from above by the district

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[1] For example, another high school in the district that chose to comply with the district's software policy was forced to discontinue some of their computer courses. One of these discontinued courses was considered necessary for students who wanted to enter the University of California, Berkeley as freshman with a major in Computer Science.

policy and legal system and from below by teachers' and students' educational needs.

Copying software, while somewhat of a tangential issue for the business, journalism, and science teachers[1], was an issue of acute concern for the three computer science teachers. These teachers felt they faced a no-win situation. From their perspective, copying was wrong from both a legal and a moral point of view. As such, using illegal copies in the classroom presented students with a poor model for respecting both the law and the efforts of other people's labor. However, refraining from the use of illegal copies meant not offering computer courses, thereby sacrificing the quality of students' education and, to some extent, failing in their responsibilities as

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[1] The following descriptions provide a flavor of the unconcerned attitudes toward copying software of the business, journalism and science teachers. The business teacher remarked that all the software and manuals in his department were illegal, but seemed resigned and somewhat unconcerned with the situation. The journalism teacher was uncertain if the word processing programs he assigned to students were illegal copies (which they were) and chose not to investigate the situation further. He considered his students responsible and, therefore, did not worry about students making unauthorized copies. The science teacher, aware of short funds for software and not wanting to use illegal software, consciously decided not to integrate computer use into her biology class even though from an educational standpoint she found the possibility enticing. No clear reason emerged for these teachers' lack of involvement with the issue of copying software, though it is noteworthy that none of these courses or programs depended entirely on the use of computer software.

teachers. These conflicts surfaced in the teachers actions and classroom practices. For example, given that students' education was at stake, teachers would at times defend the school's practice of using illegal copies. In addition, teachers largely refused to teach ethics to students while the illegal copies were in classroom use. As one teacher said, "It's one thing to have students use illegal copies. It's another thing to get up in front of the class and be a hypocrite and tell the kids not to copy." Teachers also reported they would not actively look for students copying commercial software; however, if they discovered someone copying they would confiscate the disk for a couple of days and say something to the effect, "You shouldn't have let me see that. You know I'm not allowed to let you copy. Next time be more discrete." Thus teachers moderately policed the activity but would not make a principled statement against copying.

Students, who experienced the conflicts embedded in the district's, principal's, and teachers' actions, shared no single understanding of school rules and practices pertaining to copying software. Slightly more than half of the students interviewed (60%) thought explicit or implicit school rules existed against copying software. Over half of these students (58%) provided justifications in the context of society for the rule's existence, emphasizing rights and law. For example, some students believed the rule existed to protect the author's property rights (e.g., "[The rule's] protecting the individual who wrote the program from other people taking his ideas") while other students believed the rule existed to uphold the current law (e.g., "[The rule] is to follow the law. The school didn't want to be responsible or sued for probably holding a wide scale computer copying ring here. So they're saving themselves the liability of that by simply prohibiting it").

In sum, the observed conflicts surrounding classroom interactions pertaining to copying software were partly in response to the institutionalization at the district level of a policy that upheld the property rights status of computer programs while not providing compensatory funding for purchasing programs. This inadequate funding caused a dilemma for the teachers who, while sensitive to the ethical problem of copying, were also unwilling to compromise students' education. The resulting conflicts help explain why teachers at times condoned and at times prohibited unauthorized copying of commercial software and why so little explicit instruction addressed the issues with students. Finally, the various tensions that can be traced from district administrators to the principal to teachers illustrate how a societal issue can take on new meanings and dimensions as it moves through various levels of a school system to eventually shape classroom practices.

Accessing Computer Files

Observations: An outsider's view.

In stark contrast to the observable conflicts surrounding copying commercial software at the school, typical classroom practices suggested that both teachers and students had little concern for the privacy of classroom computer files. Consider, for instance, observations of a normal classroom period. To distribute students' working diskettes, the teacher placed the diskettes on a central desk for students to pick up as they entered the classroom. The teacher did not supervise which student picked up which diskette. Some students brought their own personal diskettes to class, pulling these out of notebooks and jacket pockets, and intermingled these with other classroom diskettes. Students passed their working diskettes from student to student. Frequently students looked over each others' shoulders as they

worked, reading each others' working files off the screen. The teacher encouraged students to engage in this behavior. Many students left their computer programs or files in the computer's memory when they finished using the computer. Other students later came to the computer and read the previous student's work. The teacher examined students' working files without consulting students first. At the end of class, most students returned their working diskettes to the teacher's desk. Some students left their working diskettes at their desks or in the disk drives, or walked out of the class with them.

These observations of classroom practices are in agreement with the observed absence of explicit instruction on computer security and on the potentially private nature of electronic information.[1] In turn, these findings raise several questions about the treatment of electronic information at the school. As alluded to briefly in the introduction, the protection of computer

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[1] Students' only classroom experience with securing access to computer files occurred tangentially in the Computer Science 1 course where, as a programming assignment, students wrote the code to check a "secret" password before allowing access to the remainder of the program. In addition, the single instance in which computer privacy was explicitly addressed with students was a one-time showing of the film "Pirate" to the computer classes. The film highlighted some of the potentially disastrous consequences of unauthorized access to computer files. For example, in "Pirate" a teenager accesses and damages information in a man's computerized medical record resulting in the man receiving the wrong medication and ultimately causing his death. Notably, the school district (rather than teachers or the school principal) initiated the film's showing.

privacy poses a significant societal problem -- one that currently demands new state and federal laws, technical support from industry, and large investments both in money and education from the private sector. Statistics (see Bloombecker, 1986) also suggest that young people contribute disproportionately to this problem. Given this societal climate, why was such an apparently nonchalant attitude taken toward electronic information at the school? Why did students neither assert nor protect the privacy of their files? Why did teachers look in students' files and encourage students to do likewise? Finally, why did teachers not address computer privacy with students? Some answers to these questions can be found through the district administrators', principal's, teachers', and students' perceptions of computer privacy in the school context.

Perspectives: Insiders' views.

District administrators, in part responding to the societal climate, approached the issue of access to electronic information as would administrators of corporate businesses, such as banks, hospitals, and law offices. That is, the district focused on the issue of protecting the private information on citizens which is stored in computerized records. Given this focus, they took the position that accessing other people's files is unequivocally wrong and that students should be so taught. Gradually district level plans were initiated from this position. For example, the district decided on November 7, 1985 to include an ethics component in the district-wide curriculum plan for computer science which, among other topics, would examine computer privacy. In the same year the district also identified and moved to purchase a film called "Pirate" which addresses some issues and potential consequences of accessing computer files.

From the perspective of computer use outside the school setting, the principal shared the district's views that unauthorized access was unethical and potentially dangerous. Thus, she willingly supported, though did not initiate or perceive as urgent, classroom instruction on this topic. However, from the perspective of computer use within the classroom, the principal viewed decisions about access to computer files in much the same way she viewed access to students' written English assignments: Both were under the teachers' jurisdiction. The principal saw such decisions as shaped by the demands of the learning process and a legitimate component of student-teacher interactions.

In the classroom, teachers defined the parameters governing access to computer files so as to promote learning. Because they believed students learned from each other by collaborating and examining each other's work, teachers actively structured students' computer use so that files were largely public. For instance, one teacher commented to the effect "Passing code around is good. I want to encourage them [to do it]." Another teacher said, "Sharing is great as long as the kids understand it."

Students, like teachers and the principal, did not perceive computer privacy to be an issue of concern within the classroom, primarily because within the educational context students did not store personal information on school computers. While slightly more than half of the students interviewed (60%) thought a school rule existed prohibiting access to other students' computer files, most of these students (75%) provided educational justifications for the rule's existence. For example, students reasoned that the rule existed to encourage students to do their own work and to learn for themselves (e.g., "If you got someone else's computer file [and read it] ... you

wouldn't be getting out what the education is meant for ... you wouldn't learn it").

In sum, from a classroom perspective the principal, teachers, and students conceived of access to computer files as subordinate to and determined by the central task at hand -- learning. This finding helps explain why students neither asserted nor protected the privacy of their files, why teachers and students comfortably looked at others' files, and why the classroom projected a nonchalant attitude toward accessing electronic information despite the societal climate. In addition, this finding helps explain why the district plans about computer privacy did little to color or constrain classroom practice.

Discussion and Educational Implications

Toward an initial characterization of the relation between societal forces and school computer practices, the results from this study suggest that societal forces did not uniformly affect school computer practices. For while unauthorized access of computer files is of great concern societally (Bloombecker, 1985, 1986; Parker, 1984), at the school computer privacy concerns were largely non-existent. In contrast, societal concerns pertaining to copying commercial programs affected teachers' attitudes and classroom procedures, instruction, and discipline.

While a full explanation for the differential influences of comparable societal issues on school computer practices is assuredly complex, a partial answer may be found in the reciprocal relationship between schooling and society. That is, it may be that societal forces have power to constrain school practices in particularly those instances for which school practices affect individuals beyond the school community. Drawing on this study's results,

for the case of computer privacy, access to computer files at the school affected only students and teachers. Hence, societal forces were primarily deflected leaving the organization of school computer privacy practices largely within the jurisdiction of and subordinated to educational goals. In contrast, for the case of computer property, copying commercial software at the school affected individuals beyond the school -- computer software designers, programmers, and sales people. Their claims to intellectual property rights were recognized as legitimate by students and school personnel and coordinated with competing claims from within the school, such as the teachers' responsibility to provide students with a quality education despite a limited budget. These findings, then, point to and begin to characterize the reciprocal relation between societal forces and school practices.

Finally, much of the controversy and discussion in the educational community over issues such as copying commercial software (Slesnick, 1984) and accessing computer files (Scrogan, 1988) resembles controversies over other typical school computer practices, including allocation of computer resources and handling of electronic mail. Often central to these controversies is the struggle to balance societal concerns with educational needs. Drawing on this research, when educators establish policies and practices that govern school computer use they may find it helpful to examine how school practices affect the larger society. For in those instances where the effect is minimal, they may be at greater liberty to organize classroom computer use as they see fit to advance their educational goals.

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